Appl. No. 09/825,607
Amdt. dated January 9, 2004
Reply to Office Action of September 9, 2003

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently amended) An information processing system comprising:

a host computer; and

a storage system ~~device~~ connected to said host computer and including a plurality of disk devices and a controller coupled to said plurality of disk devices;

wherein said host computer includes:

means for storing mapping information ~~registering information about mapping relationships~~ between said plurality of disk devices and logical storage regions;

means for determining a logical storage region and physical storage regions in disk devices corresponding to the determined logical storage region in which data to be transferred to another physical storage region is stored by referring to said mapping information;

means for obtaining ~~retrieving retrieving from said information storing means~~ information indicating a destination physical storage region in a disk device ~~a range of a destination disk device~~ to which data of the determined logical storage region is transferred; ~~when data recorded on one disk device out of said plurality of disk devices is to be moved to another disk device;~~ and

means for instructing said storage system to transfer data of the determined logical storage region from the determined physical storage regions corresponding to the determined logical storage region to the destination physical storage region, said means for instructing issuing a transfer operation request for each of the determined physical storage regions corresponding to the determined logical storage region; and ~~transferring to said storage device information indicating a range in a disk device in a disk device retrieved by said retrieving means and a range of data to be moved;~~

said storage system ~~device~~ includes:

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means for <u>transferring data from the determined physical storage regions to the</u> <u>destination physical storage region.</u> ~~storing storing said information transferred by said~~ ~~transferring means;~~

~~means for reading data for said source out of said information stored in said storing~~ ~~means using said information indicating said range of data to be moved; and~~

~~means for copying copying to said destination disk device information indicating said~~ ~~region in said destination disk out of said information stored in said storing means.~~

2.   (Currently amended) An information processing <u>system</u> ~~device~~ according to claim 1, wherein

said storage <u>system</u> ~~device~~ includes means for notifying ~~notifying~~ said host computer that said <u>means for transferring</u> ~~said copying means~~ has finished ~~the data transfer;~~ and

said host computer includes means for updating <u>said</u> mapping <u>information</u> ~~relations~~ between disk devices and logical storage regions <u>according to the received notification from said</u> <u>storage system.</u> ~~registered in said information storing means after receiving said notifying means.~~

3.   (Currently amended) An information processing <u>system</u> ~~device~~ according to claim 2, wherein

said host computer includes means for stopping access<u>ing</u> to data being transferred <u>by</u> <u>said means for transferring.</u> ~~when said disk device is transferring data.~~

4.   (Currently amended) An information processing <u>system</u> ~~device~~ according to claim 3, wherein

said transferring means includes means for issuing instructions for writing said information to predetermined disk device out of said plurality of disk devices; and

said storage <u>system</u> ~~device~~ includes:

<u>a disk device for storing a request issued from said means for instructing; and</u>

means for executing <u>a request stored in said disk device for storing a request;</u> ~~said reading~~ ~~means and said copying means when said information written by said issuing means is read by~~ ~~said storage device.~~ and

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said means for instructing includes means for writing transfer operation requests to said disk device for storing a request.

5.   (Currently amended) An information processing system ~~device~~ according to claim 4, wherein said storage system ~~device~~ includes:

means for recording accesses, ~~recording accesses~~ which records storage area storing data updated during data transferring process by said means for transferring; ~~data; when an access takes place for data copied by said copying means;~~ and

means for matching data ~~contents~~ of the determined physical storage regions and the destination physical storage region ~~source data and destination data~~ according to said means for recording accesses. ~~contents recorded by said access recording means.~~

6.   (Currently amended) An information processing device connected to a storage system ~~device~~ including a plurality of disk devices comprising:

means for storing mapping information ~~registering information about mapping relationships~~ between said plurality of disk devices and logical storage regions;

means for determining a logical storage region and physical storage regions in disk devices corresponding to the determined logical storage region, in which data to be transferred to another physical storage region is stored by referring to said mapping information;

means for obtaining ~~retrieving retrieving from said information storing means~~ information indicating a destination physical storage region in a disk device ~~a range of a destination disk device~~ to which data of the determined logical storage region is transferred; ~~when data recorded on one disk device out of said plurality of disk devices is to be moved to another disk device;~~ and

means for instructing said storage system to transfer data of the determined logical storage region from the determined physical storage regions corresponding to the determined logical storage region to the destination physical storage region, wherein said means for instructing issues a transfer operation request for each of the determined physical storage regions corresponding to the determined logical storage region; ~~transferring to said storage device information indicating a range in said destination disk device retrieved by said retrieving means~~

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~~and a range of data to be moved; and~~

<u>means for receiving completion of data transfer from said storage system; and</u>

means for updating <u>said</u> mapping information between said disk devices and said logical storage regions <u>according to the received completion of data transfer.</u> ~~in said information storing means after moving of said data is finished~~.

7.   (Currently amended) An information processing device according to claim 6, wherein said ~~retrieving~~ means for obtaining includes: means for searching s~~aid information storing means for a~~ <u>the destination</u> physical storage region in ~~said~~ <u>a</u> disk device that has not been assigned to a logical storage region: <u>and retrieves information indicating the destination physical storage region found by said means for searching.</u>

~~means for retrieving said physical storage region found by said searching means as a range in said destination disk device.~~

8.   (Currently amended) An information processing device according to claim 7, wherein said ~~transferring~~ means for instructing issues <u>write requests for writing transfer operation requests into a predetermined disk device of said storage system; so that said storage system reads a transfer operation request from said predetermined disk device and executes it.</u> ~~write instructions to a predetermined disk device out of said disk devices in said storage device using said information as data.~~

~~9~~.   (Canceled)

9 ~~10~~.   (Currently amended) In an information processing <u>system</u> ~~device~~ including a host computer and a storage <u>system</u> ~~device connected to said host computer and equipped with~~ <u>including</u> a plurality of disk devices,

a method for rearranging <u>logical storage region</u> ~~data~~ in said plurality of disk devices comprising the steps of:

in said host computer <u>storing mapping information between logical storage regions and physical storage regions in said plurality of disk devices:</u>

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determining a logical storage region and physical storage regions in disk devices corresponding to the logical storage region, in which data to be transferred to another physical storage region is stored, by referring said mapping information; ~~a first disk device storing data to be rearranged;~~

obtaining ~~retrieving~~ a information indicating a destination physical storage region in a disk device to which data of the determined logical storage region is transferred; ~~about a second disk device to be a destination for said rearrangement;~~ and

instructing said storage system to transfer data of the determined logical storage region from the determined physical storage regions corresponding to the determined logical storage region to the destination physical storage region;

~~sending said determined information about said first disk device and said retrieved information about said second disk device to said storage device;~~

in said storage device,

transferring data from the determined physical storage regions to the destination physical storage region.

~~reading data from said first disk device based on said sent information about said first disk device;~~

~~storing said data read from said first disk device based on said sent information about said second disk device~~

~~notifying said host computer of completion of storing when storing of said read data is completed; and~~

~~updating a table in said host computer containing mapping relations between logical and physical regions in said plurality of disk devices after said notification.~~

~~11.~~ 10. (New) A method according to claim ~~10~~ 9, wherein the instructing step includes a step of issuing a data transfer request to said storage system for each of the determined physical storage regions.

~~12.~~ 11. (New) An information processing system comprising:

a host computer; and

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a storage system connected to said host computer and including a plurality of disk devices and a controller coupled to said plurality of disk devices;

wherein said host computer includes:

a storing component to store mapping information between said plurality of disk devices and logical storage regions,

a determining component to determine a logical storage region and physical storage regions in disk devices corresponding to the determined logical storage region, in which data to be transferred to another physical storage region is stored, by referring said mapping information,

an obtaining component to obtain information indicating a destination physical storage region in a disk device to which data of the determined logical storage region is transferred, and

an instructing component to instruct said storage system to transfer data of the determined logical storage region from the determined physical storage regions corresponding to the determined logical storage region to the destination physical storage region; and

wherein said storage system includes a transferring component to transfer data from the determined physical storage regions to the destination physical storage region according to the instruction received from said host computer.